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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,672	12/31/2001	Takayuki Sugahara	0102/0192	5082

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EXAMINER	
EDWARDS, PATRICK L	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,672	SUGAHARA ET AL.	
	Examiner	Art Unit	
	Patrick L. Edwards	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *5-8,13,14 and 21-25* is/are withdrawn from consideration.

5)☒ Claim(s) *28-330* is/are allowed.

6)☒ Claim(s) *1-4,9-12 and 15* is/are rejected.

7)☒ Claim(s) *26 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06-01-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The response received on 01 August 2006 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The arguments filed on 01 August 2006 have been fully considered. A response to these arguments is provided below.

37 CFR 1.75 Claim Objections

Summary of Argument:

Applicant alleges that the 37 CFR 1.75(a) objections are improper because the subject matter is supported by the specification.

Examiner's Response:

Applicant's argument is a mischaracterization of 37 CFR 1.75(a). The language of this rule—which is provided in the below objection—mirrors the language of 35 USC 112(2). This is not a question of having support from the specification, but rather a question of whether the claims are distinctly and unambigously claimed.

35 USC 112, First and Second Paragraph Rejections

Summary of Argument:

Applicant has amended the independent claims and argues that this obviates the previous 112(2) rejections.

Examiner's Response:

The examiner disagrees. A 112(2) rejection will be provided below.

Allowable Subject Matter

3. Claims 28-33 are allowed.

4. Claims 26 and 27 contain allowable subject matter but are dependent upon claims that are rejected on prior art grounds and grounds of indefiniteness (35 USC 112(2) and rule 75). Please be advised that an amendment to correct the indefiniteness problems may change the scope of the claims for purposes of prior art—which could conceivably necessitate a new grounds of rejection.

Claim Objections

5. The follow quotations of 37 CFR § 1.75(a) provides the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

6. Claims 1-4, 9-12, and 15-20 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery, and failing to conform to the invention as set forth in the remainder of the specification.

Regarding claims 1 and 3, these claims are generally difficult to understand what limitations correspond to what subject matter or what phrases modify which limitations. For example, the first paragraph recites generating bits that represent a predetermined patter [which correspond to a watermark]. The second paragraph recites detecting bits [in the original picture] as specified bits where a watermark can be embedded. These first two paragraphs are understandable. We have generated bits that represent a watermark pattern, and we have bits from an image where the generated watermark bits can be embedded.

The third paragraph, however, does not make any sense. It recites "storing pattern representing a specific bit pattern." But then what exactly is this "specific bit pattern"? Is it the predetermined bit pattern from paragraph 1 or the detected "specified bits" from paragraph 2? The claim goes on to recite a "specified bit pattern." But is this "specified bit pattern" correspond to the "specified bits" of paragraph 2, or the "specific bit pattern" of paragraph 3?

Further, the claim goes on to mention a "desired bit pattern" and a "specified bit pattern." What do these terms correspond to?

The problem with these claims appears to be a problem of imprecise labeling that results from the vagueness of the chosen identifiers. For example, the claim recites the following terms:

- predetermined bit pattern
- specified bits
- specific bit pattern
- specified bit pattern
- desired bit pattern

These terms are used somewhat haphazardly and interchangeably, and so it is difficult to tell what subject matter the claims are supposed to be defining.

Regarding claims 9 and 12, there is no antecedent basis for the term "watermark data." The claim refers to a watermark-embedding position, but does not make any reference to watermark data.

Further referring to claims 9 and 12, the metes and bounds of the final paragraph of the claim are unclear. The claim recites embedding in a second portion of the original picture data which corresponds to the watermark-embedding position and which adjoins the first portion of the original data. However, in the penultimate paragraph, the claim recites that a "first position of the original picture data which corresponds to the watermark embedding position." The problem here is clear. The second portion cannot correspond to both the watermark embedding

position and adjoin the first portion, because the first portion also corresponds to the watermark embedding position. These conditions can not all coexist. If we say hypothetically that:

watermark-embedding position == A

first portion of the original picture data == B

second portion of the original picture data == C

The claim is then saying that A == B and A == C, but that C == B + 1. This simply cannot be the case.

Claims 15 and 19 are rejected along the same grounds as claims 9 and 12 above.

Claims 2, 4, 10, 11, 16, 17, 18, 20, 26, and 27 are rejected because they depend from indefinite claims.

In view of the relatively egregious 112(2) problems associated with these claims, the examiner respectfully suggests that the applicant re-draft or substantially amend the claims such that the claims are more definite and a reasonable interpretation can be made.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-4, 9-12, and 15-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 3, these claims are generally difficult to understand what limitations correspond to what subject matter or what phrases modify which limitations. For example, the first paragraph recites generating bits that represent a predetermined patter [which correspond to a watermark]. The second paragraph recites detecting bits [in the original picture] as specified bits where a watermark can be embedded. These first two paragraphs are understandable. We have generated bits that represent a watermark pattern, and we have bits from an image where the generated watermark bits can be embedded.

The third paragraph, however, does not make any sense. It recites "storing pattern representing a specific bit pattern." But then what exactly is this "specific bit pattern"? Is it the predetermined bit pattern from paragraph 1 or the detected "specified bits" from paragraph 2? The claim goes on to recite a "specified bit pattern." But is this "specified bit pattern" correspond to the "specified bits" of paragraph 2, or the "specific bit pattern" of paragraph 3?

Further, the claim goes on to mention a "desired bit pattern" and a "specified bit pattern." What do these terms correspond to?

The problem with these claims appears to be a problem of imprecise labeling that results from the vagueness of the chosen identifiers. For example, the claim recites the following terms:

- predetermined bit pattern
- specified bits
- specific bit pattern

- specified bit pattern
- desired bit pattern

These terms are used somewhat haphazardly and interchangeably, and so it is difficult to tell what subject matter the claims are supposed to be defining.

Regarding claims 9 and 12, there is no antecedent basis for the term "watermark data." The claim refers to a watermark-embedding position, but does not make any reference to watermark data.

Further referring to claims 9 and 12, the metes and bounds of the final paragraph of the claim are unclear. The claim recites embedding in a second portion of the original picture data which corresponds to the watermark-embedding position and which adjoins the first portion of the original data. However, in the penultimate paragraph, the claim recites that a "first position of the original picture data which corresponds to the watermark embedding position." The problem here is clear. The second portion cannot correspond to both the watermark embedding position and adjoin the first portion, because the first portion also corresponds to the watermark embedding position. These conditions can not all coexist. If we say hypothetically that:
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Claims 2, 4, 10, 11, 16, 17, 18, 20, 26, and 27 are rejected because they depend from indefinite claims.
In view of the relatively egregious 112(2) problems associated with these claims, the examiner respectfully suggests that the applicant re-draft or substantially amend the claims such that the claims are more definite and a reasonable interpretation can be made.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Daly et al. (USPN 6,044,182).

Regarding Independent Claims 1 and 3:

- **generating bits representing a predetermined bit pattern corresponding to the watermark** [Daly discloses generating a multi-level data image representing the digital data. This digital data is a fixed bit pattern (see col. 5 lines 8-22)]

- **detecting bits in the original picture data as specified bits into which a watermark can be embedded** [Daly describes embedding watermark data into a source image. This step requires a detection of bits in the original picture.]
- **generating pattern data representing a specified bit pattern** [Daly discloses an "encoding carrier image" (see col. 5 lines 24-36). This encoding carrier image qualifies as the "specified bit pattern" required by the claim]
- **performing given logical operations between the predetermined bit pattern and the specified bit pattern to calculate a desired bit pattern for the specified bits, wherein the desired bit pattern can be converted into the specified bit pattern by the given logical operation with the predetermined bit pattern in a decoder side** [Daly discloses performing a convolution operation between the encoding carrier image and the multi-level data image. This convolution operation qualifies as the claimed "logical" operation in that the convolution operation is being performed as a bitwise operation on digital data. This convolution operation between the carrier encoded image and the multi level data image produces a "frequency dispersed image" (i.e. desired bit pattern). This "frequency dispersed image" is then embedded into the source image. Further, this desired bit pattern can be converted back into the specified bit patter in a decoder side (see Daly col. 5 lines 49-65)].
- **changing the specified bits to represent the desired bit pattern to convert the original picture data into watermark-embedded picture data** [Daly discloses embedding the frequency dispersed data into the source image. This requires a changing of the bits].

Regarding claims 2 and 4, Daly discloses that these patterns are "rotationally symmetric" (see Daly col. 7 lines 27-30).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 9, 12, 15, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Daly et al. (USPN 6,044,182) and Macy et al. (USPN 6,823,455).

Regarding claims 9 and 12, Daly discloses:

- **generating bits representing a fixed bit pattern** [Daly discloses generating a multi-level data image representing the digital data. This digital data is a fixed bit pattern (see col. 5 lines 8-22)]

- **deciding a watermark embedding position with respect to the original picture data** [Daly describes embedding watermark data into a source image. This step requires a decision about where the watermark should be embedded.]
- **generating pattern data representing a specified bit pattern** [Daly discloses an "encoding carrier image" (see col. 5 lines 24-36). This encoding carrier image qualifies as the "specified bit pattern" required by the claim]
- **performing given logical operation between the fixed bit pattern and the specified bit pattern to calculate a desired bit pattern for specified bits, the specified bits being among bits in a first portion of the original picutre data which corresponds to the watermark embedding position, wherein the desired bit pattern can be converted into the specified bit pattern by the given logical operation with the fixed bit pattern in a decoder side** [Daly discloses performing a convolution operation between the encoding carrier image and the multi-level data image. This convolution operation qualifies as the claimed "logical" operation in that the convolution operation is being performed as a bitwise operation on digital data. This convolution operation between the carrier encoded image and the multi level data image produces a "frequency dispersed image" (i.e. desired bit pattern). This "frequency dispersed image" is then embedded into the source image. Inherently, this "frequency dispersed image" is embedded into a watermark embedding position because the "frequency dispersed image" itself is acting as a watermark of the source image. Further, this desired bit pattern can be converted back into the specified bit patter in a decoder side (see Daly col. 5 lines 49-65)].
- **changing the specified bits to represent the desired bit pattern, and embedding a result of the executed given logical operation in a second portion of the original picture data which corresponds to the watermark-embedding position and which adjoins the first portion of the original picture data** [Given the problems of indefiniteness associated with this limitation, it is difficult to apply art to this limitation because its meaning is unclear. However, Daly does disclose embedding a result of the executed given logical operation to a portion of original picture data. In light of this disclosure, embedding a second watermark in a second position would have been obvious if a second watermark were necessary for identification purposes.]

Daly fails to expressly disclose executing a logical operation between watermark data and the random number data. Macy, however, discloses generating a random number and using that random number to produce a watermark (Macy col. 3 lines 16-21). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the Rodriguez method by executing a logical operation with a random number as taught by Macy. Such a modification would have allowed for a method/apparatus that could produce a watermark with enhanced visibility, detection reliability, and robustness (see Macy col. 4 lines 6-14).

Regarding claims 15 and 19, the above analysis is incorporated herein, and it is noted that Daly further discloses watermarks which are 2 dimensional in nature [This is described throughout the Daly disclosure (see, e.g., at col. 7 lines 41-60 and elsewhere thoughout the specification).].

Regarding claim 20, Daly discloses that the watermark is rotationally symmetric (see Daly col. 7 lines 27-30).

13. Claims 10-11 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Daly and Macy as applied above, and further in view of Numao et al. (USPN 6,055,321).

Regarding claim 10, the afore-cited combination fails to expressly disclose that the watermark embedding position is composed of sub positions dispersing in a frame. Numao—which is in the same field of disclosure—teaches dispersively hiding the watermark (i.e. it is composed of sub-positions dispersing in a frame). See Numao col. 2 line 65 – col. 3 line 13. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Daly and Macy by dispersing the watermark throughout the image as taught by Numao. Such a modification would have allowed that was distributed over the image rather than pinpointed in a central location. It is preferable to distribute the message over the image because a locally hidden message may degrade the quality of that region when its amount is large. Additionally, if part of the image is cut off, it is likely to be able to extract the message if it is distrubuted over the image (see Numao col. 1 lines 50-55).

Regarding claim 11, Numao further discloses that the embedding position deciding means comprises means for dividing the original picture data into equal size blocks, means for calculating a degree of complexity of a picture portion represented by each of equal size blocks, means for selecting ones among the equal size blocks which correspond to calculated complexity degrees equal to or greater than a prescribed value, and means for deciding the watermark-embedding position in response to the selected ones of equal size blocks [see Numao col. 4: The reference describes calculating a complexity degree of blocks of an image as a characteristic value (Numao describes a variance operation, see col. 4 lines 16-17), and then selecting the block for watermark embedding based on that characteristic value].

Regarding claim 16, Numao discloses an embodiment where the embedding region is in a central position and a second embedding region surrounds the first (see Fig. 11: Position P0 (a first embedding region) is more in the center than P1 (which is a second embedding region)).

Regarding claim 17, see claim 11 for a discussion of the claim 17 limitation.

Regarding claim 18, Daly discloses this limitation, it has been discussed above with respect to claim 20.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Nakamura et al. (USPN 6,246,775) – Uses a random number to generate a watermark in a watermark embedding environment
- Rhoads (USPN 6,122,403) – teaches many watermarking-related aspects of the present invention, including watermarks that are rotationally symmetric.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (571) 272-7390. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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